

Addressing key challenges in space gravitational wave astronomy

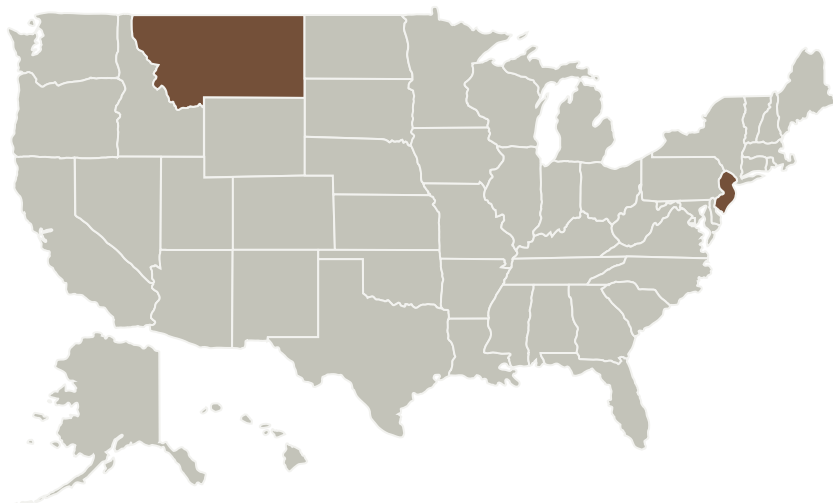
Completed Technology Project (2016 - 2018)



Project Introduction

A space based gravitational wave detector will open up the source-rich low frequency portion of the spectrum that can not be accessed from the ground, making possible some very exciting scientific studies. The rich data set collected by such an instrument will be unlike anything encountered by ground based (Laser interferometers or Pulsar timing) gravitational wave observatories, and it will take unique data analysis techniques to realize the full potential of the mission. At present, no techniques exist to exploit the discovery space opened by such a mission. Discovery potential is one of the main selling points for a mission in a new waveband. Our goal is to address this, and other key outstanding issues, by (i) Developing techniques for detecting un-modeled and un-expected signals (ii) Producing improved waveform models for spinning black hole binaries and use them to assess trade-offs in the mission design (iii) Develop robust techniques to identify possible departures from the predictions of Einstein's theory of gravity and (iv) explore the constraints that can be placed on astrophysical and modified gravity models by observing multiple systems.

Primary U.S. Work Locations and Key Partners



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Organizations Performing Work	Role	Type	Location
Montana State University - Bozeman	Lead Organization	Academia Alaska Native and Native Hawaiian Serving Institutions (ANNH)	Bozeman, Montana

Primary U.S. Work Locations	
Montana	New Jersey

Organizational Responsibility

Responsible Mission Directorate:

Science Mission Directorate (SMD)

Lead Organization:

Montana State University - Bozeman

Responsible Program:

Astrophysics Research and Analysis

Project Management

Program Director:

Michael A Garcia

Program Manager:

Dominic J Benford

Principal Investigator:

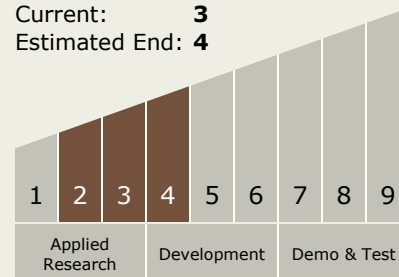
Neil J Cornish

Co-Investigators:Gijs Nelemans
Naomi K Stewart
Alberto Sesana
Nicolas Yunes
Frans Pretorius



Technology Maturity (TRL)

Start: **2**
Current: **3**
Estimated End: **4**



Technology Areas

Primary:

- TX08 Sensors and Instruments
 - └ TX08.1 Remote Sensing Instruments/Sensors
 - └ TX08.1.6 Cryogenic / Thermal

Target Destination

Outside the Solar System